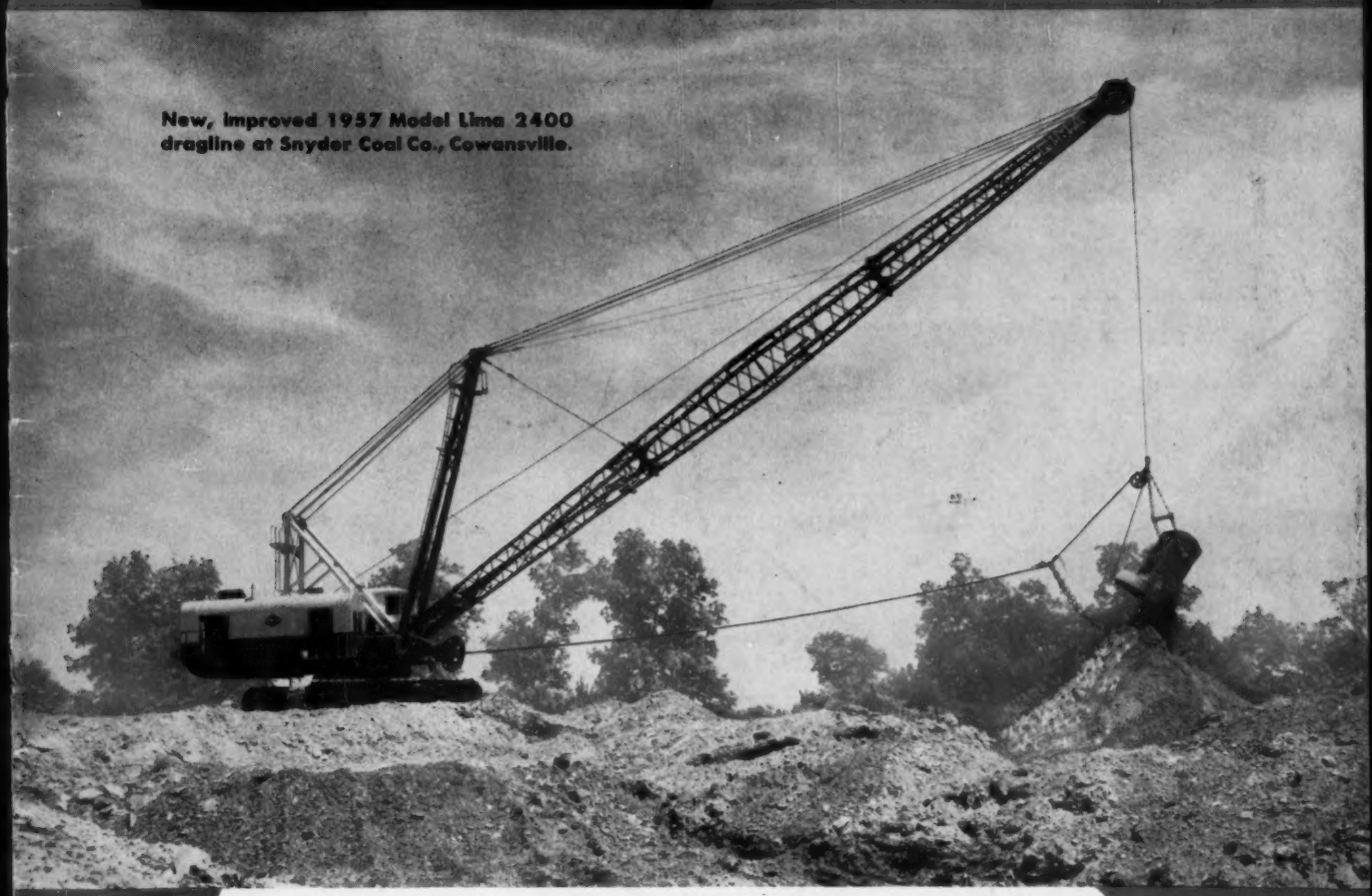
COAL MINING

August, 1957 Volume 34, No. 8



New, improved 1957 Model Lima 2400 dragline at Snyder Coal Co., Cowansville.

NEW LONG Model 88-C PIGLOADER

with the lowest operating height of any high-capacity loading machine

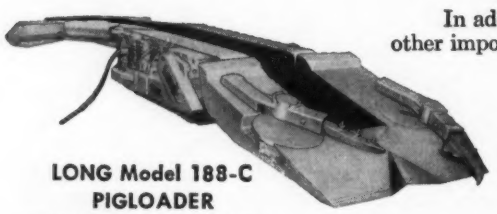
The only loader designed specifically for continuous loading with the Piggyback Conveyor System

Representing the first major innovation in loading machine design in many years, the LONG Pigloader* offers low operating height, straightforward design simplicity, minimum maintenance, high-capacity operation, full independent crawler control, unequalled stability, and unusual digging and tramming power—all vital to handling the high-concentrated tonnages of the Piggyback* Conveyor System of mining.

In this design, a single 40 HP electric motor drives all machine operations. All functions are controlled hydraulically from a single bank of finger-tip control valves. Maximum digging and tramming power is provided as the full 40 HP can be utilized for each operation. Long wheel base and wide tracks give exceptional stability and positive operation even in soft bottom. With the Pigloader's tramming and digging ability, it is able to go to the back of the cut with each pass at the face. Rated capacity is 4 to 6 tons per minute and tramming speed is 95 feet per minute.

In addition to its superior operating features, the Pigloader offers other important advantages. For example—it has fewer, heavier parts, and its simplified design greatly facilitates maintenance.

*Pigloader and Piggyback are trade marks (Reg. U.S. Pat. Off.) of The LONG Company



LONG Model 188-C PIGLOADER For Shuttle Car Loading

The Model 188-C is identical to the 88-C, except it is equipped with a swing boom for loading into shuttle cars.

Write for Bulletin No. 4010—or ask for a demonstration.

The LONG Company
Oak Hill, W. Va.

A Southern Ohio stripper cut over-all mining costs 25 cents per ton by augering low-cost recovery coal with this McCarthy Coal Recovery Drill. The recovery coal itself cost $1.25 less per ton than the strip coal.

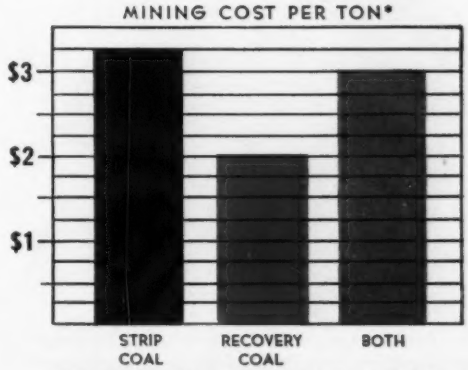
AUGERED and STRIP COAL COMBINED CUTS STRIPPER'S COST 25 cents per ton

Auger-mine low-cost recovery coal to lower your stripping costs—as much as 25 cents a ton!

One Southern Ohio strip mine operator saved this much with only one McCarthy Model 14-30-36 Coal Recovery Drill. Working one six-hour shift per day with only two operators, he augered approximately 10,000 tons per month of recovery coal. The cost per ton, including make-ready, operation, maintenance, depreciation and hauling, was only $2. By spreading this saving over his entire operation, he cut his delivered strip coal cost from $3.25 to $3 per ton. Strip coal output was about 40,000 tons per month.

This is why more strippers each year add McCarthy Coal Recovery Drills to their list of production equipment. The McCarthy drill is a cost-saver and a money-maker. It's self-moving, all hydraulic, and requires only two operators. Contact the nearest Salem Tool representative for details. For immediate service, phone or write direct.

It Pays to Auger-Mine Low-Cost Recovery Coal



*Based on 10,000 tons of augered coal and 40,000 tons of stripped coal per month.

Manufacturer of Drilling Equipment Since 1901

THE SALEM TOOL CO.

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Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices, Erie, Pa. Pittsburgh Office: P. F. JASIK, Publisher, 4575 Country Club Drive, Pittsburgh 36, Pa. Price: In the United States, $3.00 year; all other countries $5.00. Single copy 25 cents. Entered as second class matter at the Post Office at Erie, Penna., under the act of March 3, 1879.

KEEP Your CAT® Equipment on the JOB with

TIME

MONEY

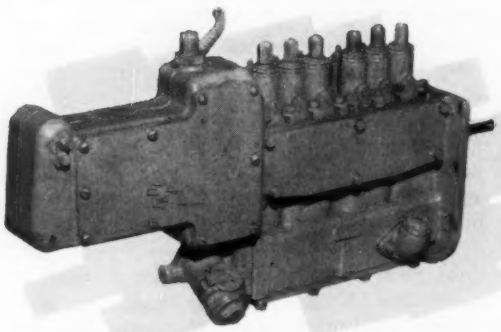
INCONVENIENCE

Major Assemblies . . . Rebuilt and Warranted.
Ready for Installation on Your Equipment.

Master Clutch for Caterpillar D8 Tractor. Also available for Cat D7 Tractors.

No. 44 Hydraulic Control for Caterpillar D4 Tractor.

Cat D6 and Cat D7 Hydraulic Steering Booster.



Fuel Pump and Governor Housing for Cat D8 Tractor. Also available for Caterpillar D7 Tractor.

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

PICK UP REBUILT ASSEMBLIES IMMEDIATELY AT THE COST OF REBUILDING YOUR PRESENT PARTS

Be sure to give us the serial number of your Caterpillar Equipment for which the assembly is to be used. Such information will eliminate the possibility of error.

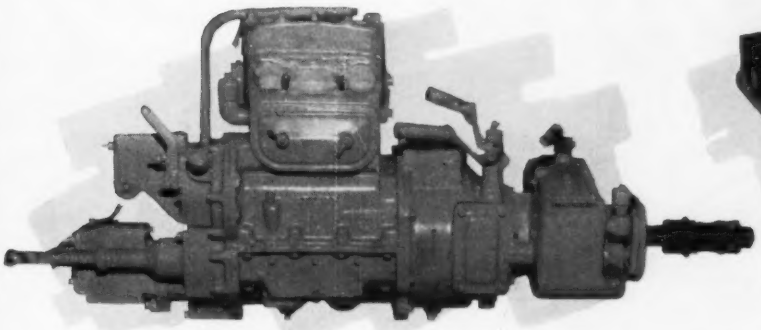
BECKWITH'S CATERPILLAR® PARTS EXCHANGE PLAN

Save on "Down-Time" by reducing the period your money-making equipment is out of service. Lose fewer man hours and keep work moving on schedule. How? Take advantage of Beckwith's Caterpillar Parts Exchange Plan. At the same time you speed repairs you are also keeping your costs low because you save hours and labor to disassemble, repair and reassemble the unit.

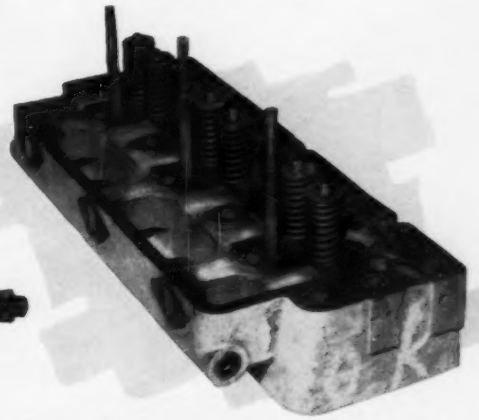
Merely tell any of our Service Managers what assembly you need. We check our stock of Exchange Parts. Chances are that we can fill your needs from our inventory. We supply this assembly—completely rebuilt and carrying our standard warranty on parts and workmanship—from stocks carried at each location.

We then take your present assembly, rebuild it and put it in our inventory, replacing the one we have provided you!

You are billed for the time and material necessary to put your original assembly in condition equal to the exchange.

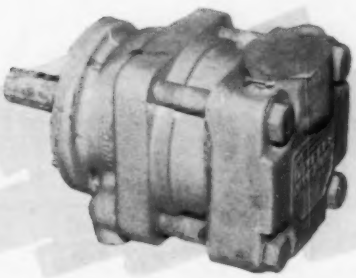


Shown is Starting Engine for Caterpillar D7 or D8. Also in Exchange Plan stock are Starting Engines for Cat D2, D4, and D9 Tractors; DW21 wheel Tractor; Cat D17,000, D326, D337, D375 and D397 Engines.



Cylinder Head complete with valves for D13000 Diesel Engine or Caterpillar D8 Tractor. Heads for all Cat Engines are available on Exchange basis.

Caterpillar D4 Tractor Brake Bands. Bands also in Exchange Inventory for Cat D6, D7 and D8 Tractors.



Hydraulic Pump for No. 933 Traxcavator. Exchange Pumps also in stock for No. 955 Traxcavator and #6 Shovel.

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A wide, low bowl is important in a scraper, but it takes more than just low-bowl design to give you performance with the best profit factor.

That's why Allis-Chalmers combines this with other equally important features to give you the most efficient scrapers available.

CHECK THIS PROFIT-BUILDING COMBINATION:

1.

Low, wide-bowl design for fast, heaped loading.

2.

Curved bowl bottom and offset cutting edge for faster, easier penetration and live, boiling loads that fill every corner of bowl.

3.

Patented apron-ejector linkage combines high apron lift with positive, forward forced ejection—permits either quick, complete dump or smooth, even spreading.

Your Allis-Chalmers dealer will be glad to discuss these and many other profitable advantages with you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

COAL MINING

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Contents

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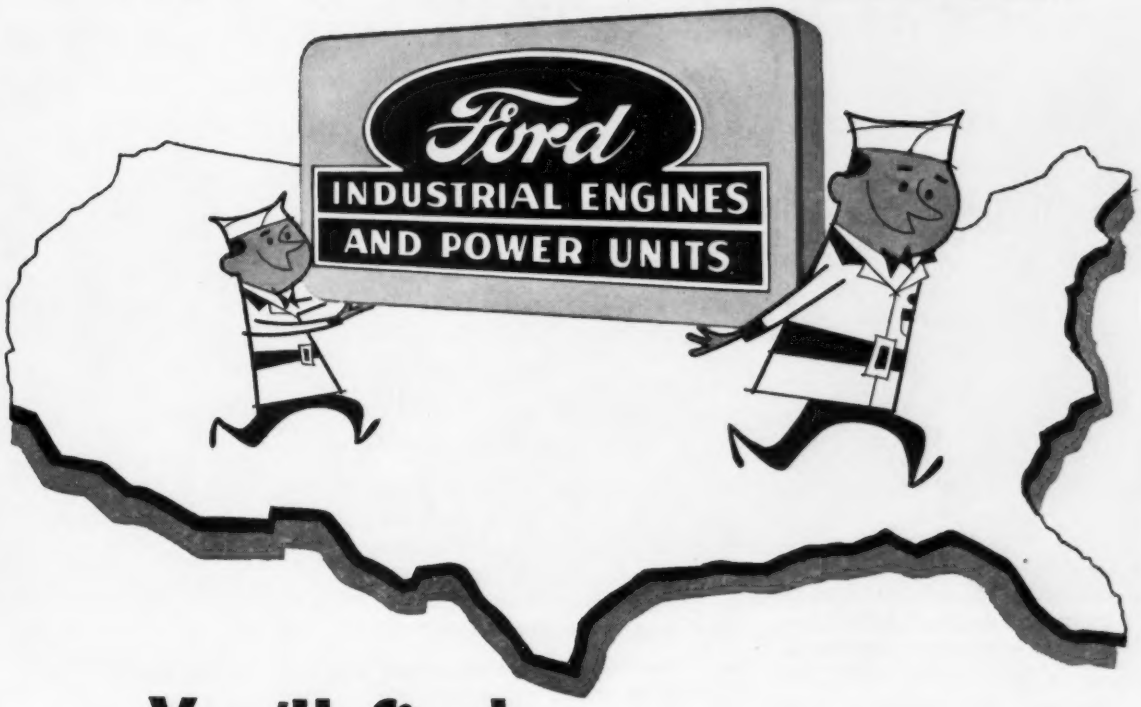
Whether it's repair or replacement...



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Know why so many industrial power users are swinging over to *Ford* power? One reason is service.

Ford power users *know* there's always a Ford Dealer nearby to give service when it's needed . . . to keep downtime at a minimum. And because Ford Dealers carry an inventory of the more commonly purchased engine parts, the Ford power user need never invest in a big parts inventory of his own.

Also, across the country, you'll find a network of newly established Ford Industrial Power Headquarters. Each is equipped to repower any type of equipment with dependable, low-cost Ford power.

It's the availability of service like this—wherever you are—that helps keep your operating costs *low*. If you are considering a new power unit or engine assembly—4-, 6- or 8-cylinder—see your Ford Industrial Products Dealer. He will be very happy to discuss your power requirements with you and make sure you get the one right power unit for *your* job. Write to the address below for further information.

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AND POWER UNITS

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HERE AND THERE IN THE COAL INDUSTRY

JOHN C. FOX

Appointment of John Cameron Fox as Secretary of the Society of Mining Engineers of AIME has been announced at New York headquarters of the American Institute of Mining, Metallurgical, and Petroleum Engineers. Mr. Fox succeeds Arnold Buzzalini, who has resigned to enter the field of consulting Geology.

Mr. Fox has had an extensive career in mining and as an instructor and writer in that field. Graduated from the School of Mines, Columbia University, in 1940 with the degree of Bachelor of Science, he later taught there for four years.

Born in New York, Mr. Fox was a milkman, truck driver and seaman before turning to mining engineering. He was a surveyor for the Getchell Mining Company and, while attending Columbia, worked in the New York offices of the Chile Exploration Company. Starting with the New Jersey Zinc Company as a laborer he worked up to mine engineer. Mr. Fox was in Cuba with the Nicaro Nickel Company, a subsidiary of the Freeport Sulphur Company and became technical representative of the Explosive Department of E. I. du Pont de Nemours & Company.

Prior to accepting his present position, Mr. Fox was Assistant Manager of the Mining Division of the American Metal Company, Ltd. Gold, lead, zinc, copper, nickel and coal mining have been among his activities. Mr. Fox also has been highly successful as a writer on mining engineering. He has been Editor of Mining Congress Journal and on the staff of the Canadian Mining Journal. Mr. Fox has also been a contributor to Engineering and Mining Journal and to American Metal Market.

• Appointment of Leslie H. Todd as deep mine explosives engineer, Austin Powder Company, is announced by Norman T. Allexander, vice president.

Mr. Todd is well qualified for his new position, having served 22 years as either mine manager or superintendent with four West Kentucky mines. These include Pacific Coal Co., Central City; Hart Ross-Cardinal Coal Co., Madisonville; Nashville Coal Co. and West Virginia Coal Co., both in Madisonville. In addtion, he has had experience working all the No. 6, No. 9, No. 11 and No. 14 seams found in West Kentucky.

A member of the Western Kentucky Mine Institute, Mr. Todd will make his headquarters at 452 South Madison in Madisonville.

LESLIE H. TODD

Do You Know?

• Skin grafts will be sprayed on in future, if a method reported at the American College of Surgeons meeting in San Francisco is adopted.

It is expected to be particularly useful for burn victims who have lost skin over large areas and have not enough left for suitable grafts by other methods.

The skin for grafts is put into an electric kitchen blender which divides the material into tiny particles suspended in salt solution. The suspension of skin particles is then sprayed by syringe onto a piece of fine mesh gauze that has been cut to fit the area needing a graft.

The skin particles are deposited as a thin layer over one surface of the gauze. This is then inverted and placed over the graft area. By the third week after, the numerous scattered islands of skin have grown to cover completely the entire area.

Success with the method in all but three of 32 rabbits on whom it was tried was reported by Drs. John S. Najarian and Horace J. McCorkle of the University of California, San Francisco.

For best protection against flash burns wear snug-fitting clothing of wool, nylon, dacron and clothing treated with flame retardants, advised Dr. George D. Zuidema and associates of the Aero Medical Laboratory, Wright Patterson Air Development Center, Dayton, Ohio.

The advice is based on tests of 33 different fabrics against flash burns of the type that occur in aircraft accidents or industrial explosions when liquid fuel explodes and burns.

ENZYME INJECTION PREVENTS CRIPPLING OF CRUSHED HANDS

• An injection of the enzyme hyaluronidase can prevent the permanent crippling of hands and fingers that have been accidentally crushed, Dr. Carl E. Nemethi of California Lutheran Hospital, Los Angeles, reported to the American Society for Surgery of the Hand meeting.

Hyaluronidase prevents or decreases the swelling that takes place in injured tissue, an occurance which restricts the blood supply to the injured area, Dr. Nemethi reported. This blood supply decrease is believed to be a factor in crippling, he said.

Hyaluronidase was used in about 200 cases and helped reduce the post-operative pain and permitted hand motion necessary for maximum recovery, the physician reported.

One case described was that of a 32-year-old factory worker whose hand was crushed when 1,000 pounds of steel fell upon it. The preservation of a blood supply gave him a useful hand after an accident which might otherwise have resulted in amputation, Dr. Nemethi said.

He also emphasized that surgical and medical care should be given "within minutes and not hours following injury."

"In a majority of cases the patient is made comfortable by aspirin, eliminating the need for narcotics, barbiturates or derivatives," he said.

On the first post-operative day all of them exercised their fingers and thumb freely without restrictive motion pain, and most of them returned to work on the second or third day to one-handed jobs, using the uninjured hand, he said.

ALL OPERATIONS ARE COMPLETELY INDEPENDENT — In addition to eliminating shifting time, *Independent-Travel* allows the operator to swing and hoist the load while travelling. Whether to save time or to jockey the boom around obstacles, the operator can swing the boom while his machine is travelling in either direction. This optional feature can be used with any front-end attachment.

Getting 9 hours' output in 8

Independent-Swing-and-Travel is available on 11 Link-Belt Speeder models. Eliminates shifting . . . saves 20-30 seconds each move

Link-Belt Speeder users are setting new high-production standards by equipping their machines with *Independent-Swing-and-Travel.* Why? It eliminates time losses ordinarily occurring when the operator shifts from swing to travel and from travel to swing. With *Independent-Travel* shifts are eliminated and the machine can swing and travel simultaneously . . . you can jockey the boom around obstacles in tight quarters, move away from bank cave-ins in split seconds!

If you'd like complete details, proof that *Independent-Travel* can up output . . . cut maintenance and spare parts costs, too — see your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

MORE USABLE HORSEPOWER — Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

14,324

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

MAINTENANCE

of Electrical Equipment for

FIRE PREVENTION

By ERNEST W. FAIR

Fires of all kinds resulting from electrical causes, and primarily due to improper maintenance thereon, represent 10.11 per cent of all fire causes, latest statistics show. The expensive repairs, costs of damage to other equipment, delays in work output and the ever present hazard of a small fire of this nature resulting in a major loss make this type of maintenance one requiring closest supervision.

Statistics have shown that the chief causes of electrical fires are arcing, sparking, over-heating, switchboards, transformers, generators, motors, wiring, switches, lightning arresters, switchboards and panel boxes. They are spots to which primary emphasis should be given.

Electricity passing over a circuit generates heat and as the temperature rises the resistance in the material involved also rises except in carbon where it decreases. Fire results.

Arcing, first named in the above list, is caused by the interruption of flow of the current and here temperatures can be very high and if they come in contact with combustible materials fire results. Arcing possibilities can be reduced by making sure all connecting joints and tie-ins are secure during frequent inspections and keeping a close watch for any exposed wiring which may have developed since the last maintenance inspection. Rough edges at the end of conduit should be properly nippled. The insulation on wiring or other conductors which pass through partitions or are held on supports should be another point checked.

Sparking occurs if conductors come in contact with metal, such as the conduit itself, the metal used in the insulation of the conductor, metallic supports, nails or junction boxes. The maintenance inspection procedure on this point is obvious.

Overheating is usually caused by

overloading a circuit. These occur most frequently where home made additions to a circuit are set up after the initial installation has been made. These should most definitely be avoided until it has been learned that they will not overload a given circuit. In maintenance inspection particular emphasis should be made on searching out temporary cut-ins that employees themselves have made.

Checking switchboards is primarily the business of looking for defects such as loose connections, lack of cleanliness, and freedom from adjacent combustible material. Here again we should look for temporary shunts or tie-ins which employees have made without proper authority and these should be eliminated. Features such as overloaded relays, lightning arresters, grounding, bus bars, and wiring should be constantly examined for defects.

In the case of transformers fires which can also cause explosions. are usually due to arcs in the casing Gauges should be regularly checked to see that the oil is maintained above the arcing point of the contacts. This oil should be tested to ascertain whether or not a lighter oil has been substituted.

Greatest hazard in operation of generators is in the breaking down of the windings which causes a disalignment of the stator and the disruption of the unit. Oil feed systems for lubrication should be checked for leaks.

There are a number of hazards on motors. Motors are liable to produce arcs and sparks from lack of maintenance and from burnouts due to overloads and to low voltage in terminals. The maintenance inspection should always make certain that every motor is adequately protected from dampness, corrosion, accumulations of dust and lint, combustible material and oily waste. It also pays to frequently check the location of motors. Grounding should be checked on every maintenance inspection. The starting device used on DC current resistances should be checked to be sure they are free of combustible material because of its overheating potential.

Weekly inspections of motors should include an examination of the commutator and brushes, check of oil level in bearings, making certain oil rings turn with the shaft, seeing that the shaft is free of oil and grease from the bearings, checking accessories for grounds, blowing out open-type motors in dusty locations, checking air gap between rotor and stator, and checking motor and bearing temperatures under actual load conditions.

Semi - annual inspections of motors should include regular cleaning, checking the commutator clamping ring, checking brushes, examining brush holders for cleanliness, checking brush pressure and position, draining and wash out of oil in sleeve bearings, checking grease in bearings, making certain end play of shaft is normal and making certain that all motor covers are in good order.

In addition to these an annual inspection should be made to include cleaning out and renewing grease in bearing housings, tests of insulation, cleaning off magnetic dirt hanging on poles, checking clearance between the shaft and journal box, cleaning out undercut slots in commutators, examining connections of commutators and armature coils and inspecting armature bonds.

Wiring in general should be checked to make certain that it is protected against corrosion due to acids, vapors or electrolysis, heat and moisture and loosening at supports. Defects in knife and snap switches are arcing due to loose connections, pitting and burning of contact points, overheating and poor mechanical condition.

Lightning arresters should be inspected at connections in early spring just before the lightning season starts and every month during summer. All metals of the wiring system should be inspected monthly and in locations where they are particularly dusty, boxes should be cleaned out every week. Inspection should make sure that all covers fit tightly and are in place and that all unused knockout holes are plugged tightly. Bond wires and ground connections should not be overlooked in the maintenance inspection.

All fuses should be checked at least twice each year to be sure that circuits are not overfused. Fuse clips should be clean and tight and all connections should be checked to prevent overheating. Fuses and switches should be checked closely for any evidence of overheating. Refillable fuses should be examined and if charred replaced immediately.

Control equipment should be checked frequently for cleanliness. In all dusty locations starting switches, compensators, controllers and air circuit breakers should be cleaned and blown out at least once each week. No dirt, oil, grease or water should ever be permitted on the operating parts of control equipment. In damp or corrosive atmospheres, control parts should be painted quarterly. All nuts and screws should be tightened and every electrical or mechanical connection checked closely.

Any damaged or worn parts that are discovered during the inspection should be replaced immediately.

As a final step the following overload devices should be actually tested as part of the routine maintenance inspection: Circuit breaker tripping points should be checked monthly. Dashpot oil should be replaced if thick and gummy. Orifices in plunger should be kept clear. Leather bellows should be kept soft and pliable with neats-foot oil. Heater coils for thermal overload relays should be checked to see that they are of the correct size. Overload relay settings should be checked every six months.

OHIO COAL OPERATORS GOLF PARTY

Ed Forney, representative from the Socony-Mobile Oil Co. from Youngstown, Ohio, won the first prize of a set of golf clubs and bag.

The Ohio Coal Operators and Mining Equipment suppliers held their first of two golf parties for this year at the Belmont Hills Country Club near St. Clairsville, Ohio. The weather was fine for golf and about 125 players were in attendance, from the Tri-State area.

As usual with this group, door prizes were issued with the purchase of tickets and the prizes were numerous and worth accepting. These worthwhile prizes, which were paid for out of the proceeds, golf and a very good Smorgasbord dinner were all offered at the low cost of $7.50. The next party will be held later this season.

WE'LL HELP YOU SELECT THE

RIGHT EQUIPMENT

FOR YOUR JOB

Whether your job calls for tracks or wheels—or both —standardize on equipment built by Caterpillar, sold and serviced by your Caterpillar Dealer. Our men have the background and earthmoving experience to help evaluate your job and select the equipment needed to give your fleet the right combination of speed, power, traction and mobility. Most important, you concentrate responsibility for your equipment's performance with us. Let us give you the complete facts on balancing your equipment fleet —and keeping it 100% Caterpillar-built!

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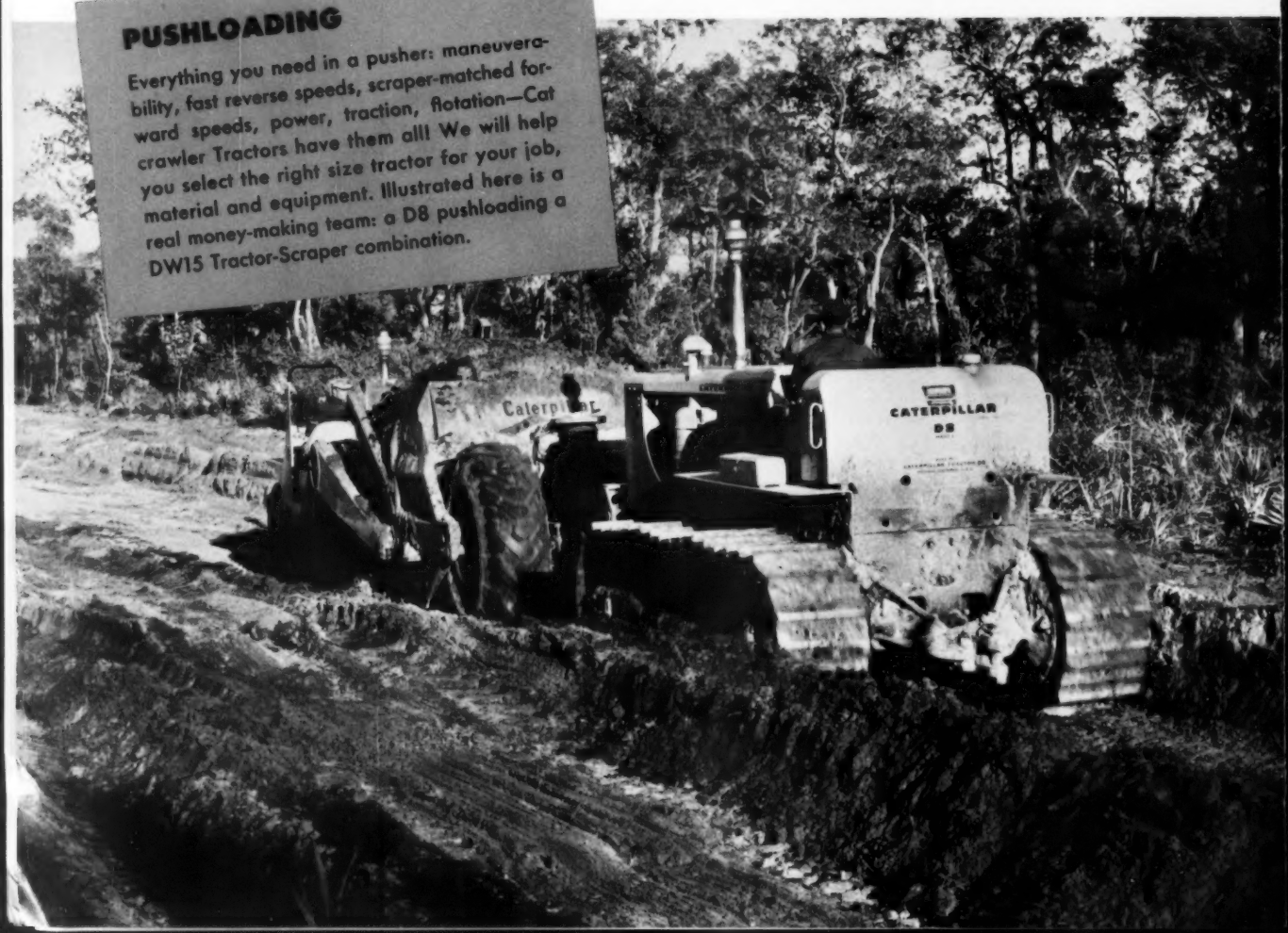
WE HAVE THE EQUIPMENT TO

match your material and haul length

PUSHLOADING

Everything you need in a pusher: maneuverability, fast reverse speeds, scraper-matched forward speeds, power, traction, flotation—Cat crawler Tractors have them all! We will help you select the right size tractor for your job, material and equipment. Illustrated here is a real money-making team: a D8 pushloading a DW15 Tractor-Scraper combination.



For short to medium hauls or operations in rough terrain here's "geared-to-the-ground" traction

D8–D7–D6 TRACTORS

Big job—small job—rock, dirt, mud or sand, short haul or long haul—roadbuilding project or farm watershed job—we have the answer to your needs. CAT* D8, D7 and D6 Tractors bring the right combination of power, versatility and traction to your fleet. We have job data and accurate standards of measurement for each of these tractors—we know how they can produce for you. Let us show you how having the right size Cat-built equipment on the right job can cut costs, make you more money.

Check these Cat track-type Tractor features: • Cat-built Diesel Engine is designed and built specifically for each tractor • Precombustion chambers burn low-cost fuels • Exclusive Cat oil clutch is virtually adjustment-free and lasts much longer than ordinary dry clutches • Two-position front idlers make it easy to convert D8 or D7 to either front-end or drawbar work • Hydraulic boosted steering clutches are standard on these tractors • Other hidden values include 90° tapered splines for perfect gear and shaft mating • "Hi-Electro" hardening of critical parts for longer life • Helical gear transmissions for smooth shifting • Companion equipment is available to match each tractor's power and speed.

CAT DIESEL TRACTOR SPECIFICATIONS

	D8	D7	D6
Horsepower			
Drawbar	155	102	75
Engine	191	128	93
Speeds			
Forward	5 (Infinite with Torque Converter)	5	5
Reverse	3	4	4
Flywheel Clutch	Oil (Dry with Torque Converter)	Oil	Oil
Track Roller Frame	box section, reinforced		
Number of Rollers	7	5	6

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

STANDARDIZE ON CAT-BUILT EQUIPMENT

DOZING

Brute strength counts here—ability to work over sharp rocks—traction to deliver maximum power—stability for perfect control of blade and tractor—low center of gravity for hillside operation—maneuverability. This is a job for Cat track-type Tractors. We have the tractors and dozers you need.

LOADING

There's a Cat-built Tractor and matching scraper to fit your job. Cat Diesel Tractors have the traction, lugging ability and accurate control to make every second pay off in the cut; fast speeds to lower cycle time on the haul, and maneuverability at the fill. Ask us about job zoning your fleet with the right machine for each job.

CAT DW15

(Series E)

TRACTOR

No. 428

LOWBOWL SCRAPER

For fast hauls—for time-saving maneuverability in the cut or fill, get the facts on the new Cat DW15 (Series E) Tractor! It's bigger, heavier, faster, more powerful than ever. Matched to its speed and power is the new 18 cu. yd. (heaped) Cat No. 428 LOWBOWL Scraper. Here's a well-balanced team to cut your earthmoving costs—and to bring new speed and profits to your jobs. The DW15 has a top speed of 37.2 MPH and maximum rimpull of 27,500 lb. The No. 428 Scraper is of LOWBOWL design —every component is engineered for fast capacity loading. Other matched equipment we can furnish for the DW15 includes the Athey PR15 Rear Dump Hauler, as well as drawbar-pulled rollers, compactors, water tanks and construction harrows.

CAT DW15 (Series E) TRACTOR SPECIFICATIONS

Engine	Cat-built, 4-cycle diesel, 200 HP (Maximum output)
Speeds	10 forward from 2.7 to 37.2 MPH, 2 reverse up to 5.1 MPH
Tires	Front—12.0–20 (14 ply rating) Drivers—(Tubeless) 26.5–25 (20 ply rating)

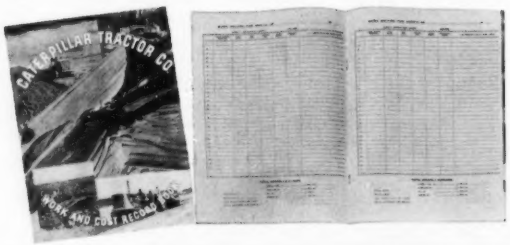
No. 428 LOWBOWL SCRAPER SPECIFICATIONS

Capacity	13.0 cu. yd. (Struck)—18.0 cu. yd. (Heaped)
Tires	(Tubeless) 26.5–25 (20 ply rating)

Tubeless design eliminates 80% of downtime due to tire failure; wide section gives more flotation and traction.

SEND FOR FREE BOOKLET...

Keep track of your operating costs, service expenses, and hours of work in this handy cost record book. Pick one up at our headquarters, or write Caterpillar Tractor Co., Dept. 178, Peoria, Ill.



***Sold, serviced, backed by your* CATERPILLAR DEALER**

General view of the Truax-Traer Coal Co. of Elkville, Illinois.

THE FEDERAL WAGE-HOUR LAW

Question-and-Answer Box

A. General Questions

1. What is the Federal Wage and Hour Law?

It is the law that puts a floor under wages, requires overtime pay after 40 hours a week, and restricts child labor. Its official name is the "Fair Labor Standards Act."

2. Who enforces this law?

The U. S. Department of Labor, through its Wage and Hour Division, with offices in every State.

3. Do the minimum wage and overtime pay requirements of the law apply to all who work for a living?

No. The law applies to some 24 million workers engaged in or producing goods for interstate or foreign commerce in about 800,000 firms throughout the United States.

4. What must an employer do if he has "covered" workers?

Unless a specific "exemption" applies, he must pay them at least $1.00 an hour, time and one-half their regular rate for all hours worked over 40 a week, and observe the child-labor provisions. He must also keep adequate payroll records.

B. Questions on Coverage

5. What is meant by a "covered" employee?

One who is engaged in interstate or foreign commerce, or in the production of goods for such commerce, including occupations closely related and directly essential to such production.

6. Does a worker actually have to be making some kind of goods in order to be "covered"?

No. The law also covers such persons as office employees, watchmen, guards, porters and other maintenance workers, shipping clerks and transportation workers, and sales personnel, among others.

7. If a manufacturer sells all his products within the State, are his employees covered?

They may be. If, at the time of producing goods, the manufacturer knows or has reason to believe that they will be shipped out of the State, directly or indirectly, or as a part or ingredient of other goods, his employees are covered.

C. Questions on Exemptions

8. What is an "exemption"?

An exemption is a provision of the law which says that a "covered" employee need not be paid according to the law's pay provisions. There are some exemptions from both the minimum wage and overtime provisions; others are overtime pay exemptions only and may be complete or partial. Some exemptions apply to certain industries, others to employees in specific occupations. There are also a few exemptions from the child-labor provisions.

9. Has the law any special provisions for women workers?

No. The law applies the same way to both male and female employees. It also applies to home workers, as well as factory and office employees.

10. Does the law apply only to workers paid an hourly rate?

The law applies regardless of whether pay is by the hour, or on a salary, piece-work or other basis. The worker must be paid *at a rate of* at least $1.00 an hour and time and one-half his regular rate for overtime, no matter what the basis of payment.

11. If an employee works 9 hours in one day, is he entitled to overtime pay for the ninth hour, as such?

No. Overtime begins after 40 hours of work in the workweek. There is no daily overtime requirement.

12. Is the overtime rate time and one-half the $1.00-an-hour minimum?

No. Overtime must be computed at time and one-half the employee's regular hourly rate of pay. If he's paid at a rate of $2.00 an hour, his overtime would be $3.00 an hour.

13. Must employees of retail stores be paid $1.00 an hour and time and one-half after 40 hours a week?

Generally, no. The law provides an exemption for retail and service establishments, provided certain tests are met.

14. What are some typical retail establishments?

These are some of the kinds of retail establishments that are usually exempt: Automobile dealers, barber shops, beauty parlors, clothing stores, department stores, dry-goods stores, drug stores, farm-implement dealers, filling stations, furniture stores, garages, grocery stores, hospitals, hotels, movies and theaters. There are others, too.

15. Does the law apply to waitresses and other restaurant workers?

No. Restaurants generally are exempt as service establishments.

16. Does the retail establishment exemption apply to warehouse workers of retail chain-store organizations?

No. These workers are not within the exemption.

17. Are laundry workers subject to the law's pay provisions?

The ordinary home laundry is exempt. But if a laundry does more than 25 per cent of its work for manufacturing, mining, transportation, or communications businesses, it is not exempt.

18. Must farm workers be paid according to the minimum wage and overtime requirements?

No. Farm workers are generally exempt from the pay provisions of the law. There are also complete or partial exemptions from the pay provisions for various workers in the agricultural processing industries.

19. What is meant by the "white-collar" exemptions?

The law provides a minimum wage and overtime pay exemption for executive, administrative, and professional employees, outside salesmen, and local retailing employees, if they meet certain tests as to duties and responsibilities. In addition, there are salary tests for exemption of executive, administrative, and professional employees.

20. Are secretaries, stenographers, bookkeepers and similar office workers within the "white-collar" exemption?

No, the exemption does not apply to employees in such categories.

21. Are domestic workers entitled to minimum wage and overtime pay?

No, domestics are not covered by the law.

22. Does the law have any provisions permitting the payment of rates below $1.00 an hour?

Yes. The law provides that to the extent necessary to prevent curtailment of employment opportunities, learners, apprentices, messengers employed primarily in delivering letters and messages, and handicapped workers may be paid special minimum rates, pursuant to certificates issued by the Divisions. Such workers may not be paid special rates unless and until the certificates have been issued.

23. Are such workers, when under the Division's certificates, employed at special minimum rates within the overtime pay provisions?

Yes, such employees are due time and one-half their regular rate for all hours worked over 40 a week.

D. Questions on Child Labor

24. Does the Federal Wage-Hour Law prohibit children from working?

No, but it does prohibit the employment of "oppressive child labor."

25. What is meant by "oppressive child labor"?

The employment of children below specified minimum ages in interstate or foreign commerce, or in the production of goods for such commerce, or in establishments in or about which goods are produced for interstate commerce.

26. What are the minimum age requirements?

Sixteen years for most jobs, 18 for jobs covered by hazardous occupations orders, and 14 years for limited kinds of jobs outside school hours.

27. May a 16-year-old boy work in a factory?

Yes, unless the occupation has an 18-year age minimum under a hazardous occupations order.

28. What is a hazardous occupations order?

It is an order under which the Secretary of Labor has declared that certain occupations are particularly hazardous to minors under 18.

29. In what kinds of jobs requiring a minimum age of 18 do most accidents occur?

Driving or helping on a motor vehicle, operating elevators and riding freight elevators that don't have an assigned operator, and working in logging and sawmilling.

30. For what other jobs must a minor be at least 18?

Working in coal or metal mines and quarries, operating power-driven, wood-working, metal-forming, punching and shearing, certain bakery and certain paper-products machines, slaughtering and meat-packing occupations, making explosives and work involving exposure to radio-active substances.

31. What kind of work may a 14-or-15-year-old boy or girl do?

Office and sales work, janitorial work in rooms where there is no manufacturing or processing goods, and work in fruit and vegetable packing sheds.

32. Are there restrictions on hours of work for minors?

There are hours restrictions for 14-and 15-year-olds. Such children may work outside school hours only, and under the following lim-

itations: No more than 3 hours on a school day and no more than 8 hours on a non-school day; no more than 18 hours in a week during any part of which school is in session, and no more than 40 hours in other weeks; and all work must be performed between 7 a.m. and 7 p.m.

33. How do the child-labor provisions apply to farmers?

Farmers may not employ children under 16— whether migrant or local— in farm work during school hours. This does not apply to a farmer's own children working on the home farm.

34. How old must a child be to work in agriculture outside school hours?

There is no minimum age under the Fair Labor Standards Act for employment on farms outside school hours.

35. May children be paid less than $1.00 an hour?

The law's minimum wage and overtime pay provisions apply to adults and minors alike. So do the exemptions. Farm work, for example, is exempt from both the minimum wage and overtime pay requirements.

36. How can employers establish proof of age of the minors they employ?

By obtaining and keeping on file for each child, an age certificate which shows him to be at least the lawful age for his job.

37. Where can age certificates be obtained?

Age or employment certificates are issued under State laws, usually by local school officials, in all but four States. Federal certificates are issued in Mississippi, South Carolina, Idaho and Texas.

E. Questions on Records

38. What records must an employer keep under the Federal Wage and Hour Law?

The employer must keep records which contain the name and address of each employee, his birth date if under 19, the hours he works and his earnings, including his regular rate for any week when overtime pay is required, and other specified items.

39. Are there any special forms an employer must use for records?

No. It is required only that the records contain the information specified in the Wage-Hour Divisons' regulation Part 516. The regulations may be obtained free from the Divisions' nearest office.

40. Must an employer inform his employees if the law applies?

Firms with covered workers are required to display a poster where the employees can readily see it. The poster, which outlines the law's provisions, may be obtained free from the Wage-Hour Divisions' nearest office.

F. Questions on Recovery of Back Pay

41. What can a person do if he believes a firm is violating the Federal Wage-Hour Law?

Anyone, whether an employer, worker, or other person, may ask for the Divisions' assistance. His name will be held in confidence. If necessary, the Divisions will make an investigation and the complainant will be notified about the results. Information obtained during an investigation is treated confidentially.

42. How does an employee get back pay due under the Federal Wage-Hour Law?

There are three ways: (1) The Divisions' Administrator may supervise the payment of back wages found due after an investigation; (2) In certain circumstances, the Secretary of Labor may bring suit for back pay at the written request of the employee; (3) The employee may sue for back pay and an additional sum, up to the amount of back pay, as liquidated damages, plus attorney's fees and court costs. The employee may not bring suit if he agreed to let the Administrator supervise the back-wage payments and has been paid in full or if he asked the Secretary to sue for him.

43. Is there a time-limit on suits for back pay?

Suits for back pay must be begun within two years after the wages became due and the employer failed to pay them.

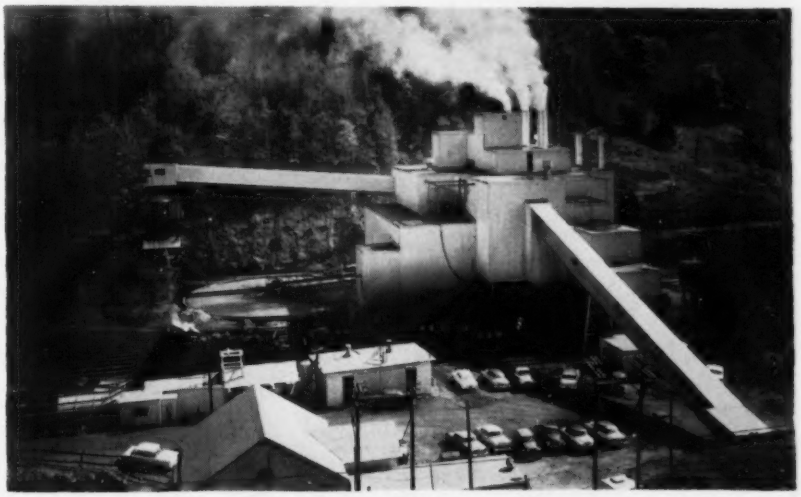
44. Does the law afford protection to the worker who seeks to get his statutory rights?

It is a violation of the law to fire or otherwise discriminate against an employee for filing a complaint or participating in a proceeding under the Act.

G. Where to Get More Information

45. Where can more information about the Federal Wage-Hour Law be obtained?

From the nearest office of the U. S. Department of Labor's Wage and Hour Division.



View of a recently constructed Link Belt Cleaning plant.

All Late Model Equipment At The Pier Coal Co.

An efficiently operated enterprise, today, generally must have equipment that will operate efficiently. The Pier Coal Company, operating near Steubenville, Ohio, must have had such a theory in mind when it re-equipped its operation with all the latest type stripping machinery.

Starting to modernize, this company purchased two new Caterpillar D-9 tractors, followed by the purchase of a new Model 4500 Manitowac dragline with 6 yard shovel and a new Mayhew blast hole drill. This equipment is stripping the Pittsburgh (Ohio No. 8) seam of coal about 6 miles West of Steubenville, Ohio. The coal will average 4½ feet in thickness and is overlaid with a yellow shale which varies in hardness as it deepens. Up to 65 feet of cover is moved. Being a steam coal no preparation facilities are used.

The Mayhew Overburden shot hole drill in operation.

One of the two Caterpillar D-9 tractors making path for the Overburden Drill and stripping shovel.

The new Manitowac Model 4500 dragline stripping overburden.

Another of the two Caterpillar D-9 tractors backfilling stripped area.

Is it time to . . .

MODERNIZE *your* FILING SYSTEM?

By ERNEST W. FAIR

There are a lot of places in which to waste money in a coal company office. There are many possibilities for inefficient methods. Adhering too long to old systems can be costly and slow the work pace.

All three are present when the office has failed to keep step with modern filing systems and methods. The work of every coal company office has not only grown more complicated and exacting as each year has gone by but there is today an increasing need for both speed and accuracy in every function. Obsolete filing systems or methods provide none of these assets.

Just a few years back the average coal company office filing system was little more than a repository for vital information to be referred to as needed. Today that function exists, of course, but the filing system is now an every day working tool of the office.

One of the great "sins" of modern office procedure is to become so rooted in tradition and routine that we fail to notice how such old fashioned methods are holding back profitable work production. We become all too aware of this when we visit the office of a new business firm where the filing system, for example, was built from nothing and employs modern methods and procedures. Then we begin to understand the reasons why our personnel have not kept pace with others and why the coal company office budget has failed to reflect a profitable return of the firm's investment therein.

Modernization of any office filing system must, of course, begin with the actual filing equipment itself. Changes in this field have probably been ignored in the past. The easiest and surest way to be certain that nothing new which we can use to profitable advantage is overlooked is to call in the salesmen of leading firms in our area and have them demonstrate their wares.

"We know our filing system is antiquated," each can be told, "so we're going to completely overhaul it. Give us your suggestions."

This will bring forth an avalanche of ideas (and equipment purchase suggestions) which will snow under any company executive BUT he will be assured that nothing really good on the market today is being overlooked.

When such information and data have been assembled we must apply a yardstick of our own to make a choice. Here are the important factors to be considered:

a) Is what we have selected adequate for our specific purpose; is it the right kind and are we buying enough of it. Too little filing equipment always means increased payroll costs.

b) Is the system selected one that accomplishes the record keeping protection desired as well as in itself being versatile enough to be easy and quick to use for every day needs?

c) Is it simple to use? At today's high clerical wages we must obtain maximum results from each hour the employee spends in use of the files. The simpler the system the easier and quicker it will be to use.

d) Does the system make it easy for transfer work?

e) Does the physical equipment possess design which calls for a very minimum of space?

In addition to these we must also consider such things as quality, durability, appearance, etc. — but the foregoing are essentials of modern filing system procedure.

The modernized filing system should also be such as to provide

a dual purpose function. Primarily it must provide filing that is always safe, secure and readily accessible. Today there is another very big requirement and that it provide us with a system for handling day-to-day routine needs without "burying" them in the mass of the entire filing system.

Our work today involves a great deal more use of research material, facts and figures based on compiled experience and in general data and statistics than ever before. The modern business world has become highly technical and no one knows this better than the average coal company executive. Many routine office matters which could be handled in the past without reference to the files now require thorough and accurate checking every time.

A good modern filing system makes this possible without the costly procedure of use of the entire records.

Consideration should also be given to numerous record keeping and filing machines and systems which have been developed today to handle such "hurry up" problems which can never sacrifice accuracy for speed. Our business equipment salesmen can tell us about these (so can the advertising pages of this magazine). Some may seem strange and out of place in a coal company office but in fact these may be the very units which will not only speed up work output but give greater assurance of accuracy than ever before.

Many offices are finding that it is much easier to proceed with this modernization on a step by step basis rather than a complete and thorough overhaul at one time. Dollar and cents reasons may also dictate that the modernization be a step here and a step there procedure.

When this is done less disruption of existing procedures and an immediate greater return usually can be obtained by starting at the very heart of the old filing system and re-building from this spot. Re-building from the outside edges means that we must carry the dead weight of the old system with us until the final stage has been reached where the first mentioned procedure gives us assurance of savings and greater efficiency from the very start of the modernization program.

This also has another asset in the alarcity with which personnel are able to adjust themselves to the new system. Any transition period between an ancient filing system and a thoroughly modernized one is bound to cause some disruptions in ways of doing things. Employees steeped in old habits take time to rid themselves of such dead weight. Losses in this area can always be reduced by applying the basic system modernization first. Then accessories and side systems are much easier to pick up and assimilate by employees.

Another modernization problem we are some times confronted with concerns itself with retention of old files. No better opportunity exists for elimination of deadwood from a filing system and transfer to permanent storage of many records therein.

Most efficiency experts recommend that we do such a house cleaning of our present filing system as a preliminary step to any modernization program. They find the average office usually needs a great deal less physical equipment when this is done before any specifications are drawn up or plans formulated. Old filing systems have a bad habit of hiding enormous piles of material which belongs in permanent transfer case storage rather than in the firm's active filing system.

Selection of modern equipment should also keep in mind that many advances in methods of physical use have been developed. We should seek out files which are easiest to use, equipment that permits the clerk to obtain desired information with speed and comfort, etc., — the advantages are so great any small additional cost is quickly repaid through savings on payroll dollars.

In some cases modern equipment we so select may call for transfer of vital records from one type or size of paper or card to another. It is best to have this done by hiring temporary outside clerical help for that one purpose than to make it a piece-meal assignment for the staff. When done in this way staff employees can proceed with their regular duties without interruption and the entire system is made available for their use in the new form much quicker than it would have been otherwise.

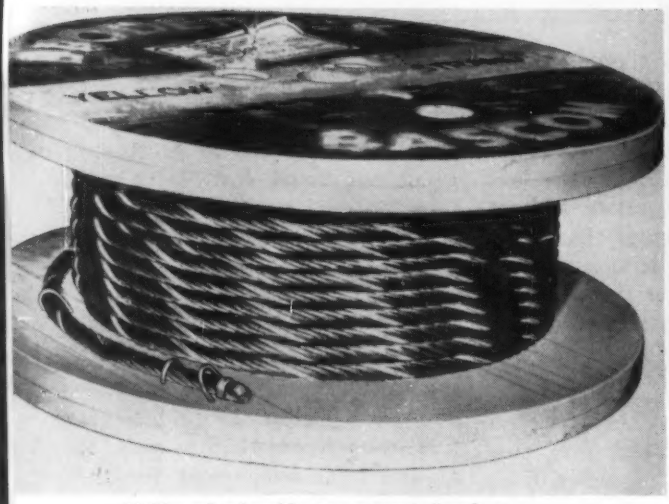
• The availability of automatic start-stop systems for four more models of diesel engines has been announced by Caterpillar Tractor Co.

The new start-stop systems, which are available as attachments, are designed for use on the Caterpillar D326 (Series F), D337 (Series F), D375 (Series D), and D397 (Series D).

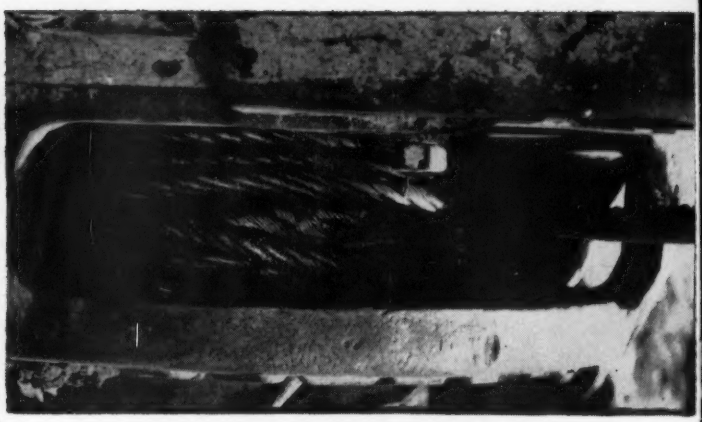
Finding principal application on electric set installations, the automatic start-stop systems instantaneously crank the diesel engine when utility power fails. When the generator comes up to 90 percent of rated voltage, an automatic transfer switch changes the load from utility source to the electric set. The transfer switch reverses the load to the utility line and shuts down the electric set when utility power is restored.

Automatic start-stop also has application where electric sets assist utility power plants during peak load periods.

The automatic start-stop systems also find use on pumping installations, where pressure or volume control is critical, but where full-time operation of the pump is not necessary.



Weld end of cable to prevent fraying.



Careless handling of cable causes kinking. Worn cable, such as the example shown here, not only means that the cable must be replaced prematurely, but presents a hazard to safety as well.

TAKE CARE OF THAT CABLE

By J. B. SINCLAIR
Service Department
Caterpillar Tractor Co.

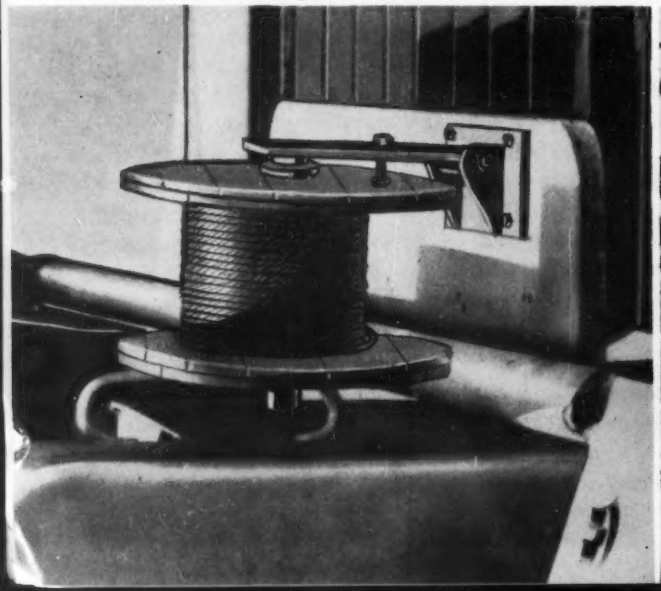
Cable is an expendable item which must be replaced frequently during the life of a machine. Many dollars can be saved each year by giving cable proper care and maintenance.

Here's what happens inside a cable as it bends when passing over a sheave and then straightens out while moving to the next sheave. The individual wires are preformed in what might be thought of as a long spiral and twisted together into strands. The strands are twisted together into a rope. This construction permits great fllexibility without excessive "stretchiness" and minimizes friction between wires as the cable bends and straightens. In operation, a cable is a group of closely fitted moving parts.

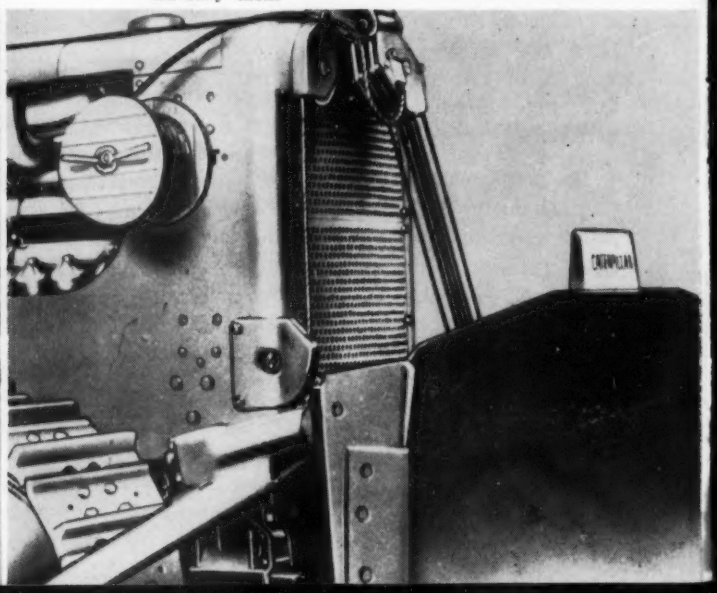
Cable, like any other part of a machine, requires reasonable care. Its service life can be shortened by abuse or lengthened by proper use and maintenance.

It's not at all uncommon to see a reel of cable rolled over an obstacle with the cable taking the brunt of the shock, or to see a pry bar being used to move a reel of cable. Whenever this occurs, some

A small, spare reel of cable, mounted as shown, makes replacement of worn or broken cable an easy task.



A small, spare reel of cable, mounted as shown, makes replacement of worn cable an easy task.



of the life is taken out of the cable before it's ever put to use.

Sharp bends or kinks in a cable are very frequently the cause of rapid wear. When bent or kinked, the wires and strands are moved out of their relative positions and unequal tensions are created on individual wires.

Kinks are caused by careless handling of the cable either on or off of the machine. When unreeling or uncoiling cable from a reel, pull the cable straight away from a rotating reel. Do not let the reel rotate faster than the cable is being removed as the danger of kinking is increased, considerably. When cable is removed from a reel which does not rotate, uncoil the length of cable required, placing one coil on top of the other. The cable can then be easily moved to the job site and installed without kinking.

Here are some other important facts to remember when installing new cable. Always be sure to use the correct cable size. Weld or otherwise bind the end of the strands of cable together. In this way, the strands are held in their relative positions and cable wear will not be excessive because of loose, high strands which have moved out of position. The strands of the cut-off end of the reel should also be secured and the end of the cable secured to the reel. Do not drive nails through the cable to secure it to the reel as wires can be damaged or broken and the cable weakened. When installing new cable, assemble the cable on the drum in the direction of the natural coils. If installed correctly the cable will have a greater tendency to reel onto the drum in a smooth layer.

KEEP CABLE CLEAN AND LUBRICATED PROPERLY

Proper lubrication of cables will extend cable life, promote safety and reduce downtime. The frequency of cable lubrication depends largely on operating conditions. If operating in dusty conditions, the cable should be lubricated sparingly, if at all, since dust will adhere to lubricant and cause wear on both cable and sheaves. Cable lubrication is recommended in areas where atmospheric conditions support rusting and corrosion. A film of lubricant will definitely extend cable life.

To prevent rusting, cable lubricants should be water resistant, contain no acids or alkalies and have a high surface tension. Each time a cable is flexed, the wires in each strand and the strands which make up the cable must slide over each other. For this reason, a penetrating, clinging lubricant of high melting point such as "crater compounds"— used for open gears and cables on shovels or cranes— should be used. In the event of an extended or seasonal shutdown, the cable should be cleaned and well lubricated. Sheaves and rollers should always be kept clean and well lubricated to facilitate free turning, and minimize sliding wear on the cables.

AVOID CABLE STRAIN BY PROPER OPERATION AND DAILY INSPECTION

Properly maintained equipment means extended life for all parts concerned. Inspections to determine operating conditions and the replacement of worn or broken parts is economy and not a waste of time or money.

The operation and maintenance of cable controlled equipment determines, to a large extent, the life of a cable. Misaligned sheaves, bad sheave grooves and frozen (non-rotating) sheaves can reduce cable life by causing burning and eventually fraying. Whenever there is excessive friction between the cable and the other parts of a machine, burning usually results. Burned cable soon becomes brittle and cracks. Cracked wires soon lead to frayed strands and a weak spot in the cable.

The useful life of cable can also be reduced by operating over sheaves that shimmy. Shimmy is caused by worn sheave bearings and results in rope vibration which causes steel fatigue.

After installing a new cable, treat it as you would a piece of new equipment. Don't overstress it. Let it break in easy so that the individual wires and strands have an opportunity to stretch and position themselves in the sheaves and around the drum. Sudden starts or stops should be avoided. Jerking out slack can break even a new cable. "Bird caging" of the cable can result from sudden stops. The sudden reduction of tension weakens cable considerably.

In almost every application in which cable is used there are points at which wear is more rapid. Therefore, it is economical to reverse the cable end for end, when wear becomes apparent.

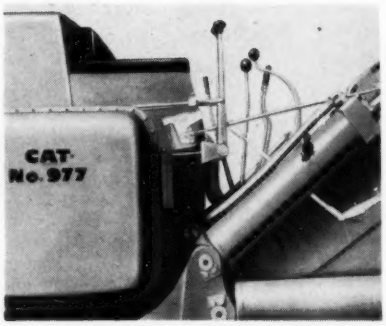
Some owners have equipped their dozers with a small spare drum or reel of cable so only the length of the cable needed can be quickly fed through the "dead end" to replace the length of cable cut off or broken. When cable wear occurs on the drum end, "dead end" wedge can be removed and new cable pulled through the system far enough to eliminate the worn section. The worn cable, anchored to the cable control drum, can be cut off as necessary and the "dead end" wedge reinstalled. Also, by cutting off one or two feet of cable periodically, "fresh" cable is located at critical wear points such as where bends occur and over sheaves.

A similar method of obtaining maximum cable life can be used on scrapers. The reels, which are mounted on the scrapers, carry extra cable which can be pulled through the system a sufficient distance to provide an unworn section of cable over sheaves. The worn cable on the cable control drum can then be cut off as necessary.

• Universal Engineering Corporation, Cedar Rapids, Iowa, announces publication of a new condensed catalog on its product line.

A twenty-page brochure illustrates and gives specifications on the manufacturer's line of crushing, screening, washing, loading, feeding and conveying equipment produced for the mining, quarrying and aggregates industries.

• Directors of Peabody Coal Co., meeting in St. Louis on July 16, elevated Merl C. Kelce, executive vice president, to the presidency. Mr. Kelce succeeds his brother, L. Russell Kelce, who died recently. T. L. Kelce, executive vice president, sales, was elected senior executive vice president, and Otto Gressens, chairman of the finance committee, was elected executive vice president.



The adjustable linkage provided with the bucket positioner on the Cat No. 933 and No. 955 Traxcavators, allows the bucket to be positioned at any point between an approximate five degree digging angle and a three degree tilt back angle.

• Automatic bucket positioners for the No. 955 and No. 933 Traxcavators have been announced by Caterpillar Tractor Co.

The bucket positioning feature, long a standard on the Cat No. 977 Traxcavator, automatically moves the bucket tilt control lever from the tilt-back position to the hold position when the bucket reaches a preset digging angle.

The adjustable linkage provided with the bucket positioner allows the bucket to be positioned at any point between an approximate five-degree digging angle and a three-degree tilt-back angle.

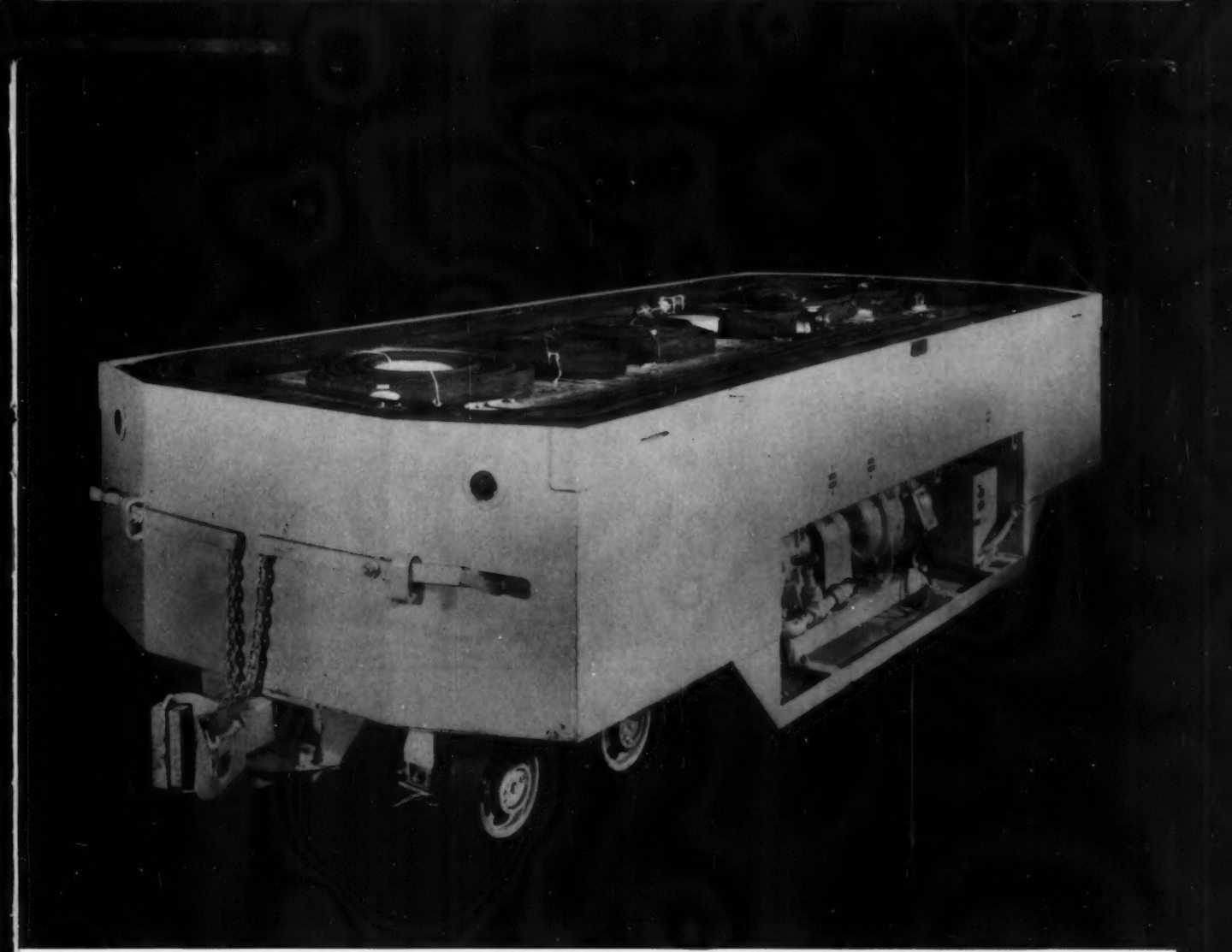
For No. 955 and No. 933 Traxcavators already in operation, field change-over kits are available.

• Performance and design features of the TS-160 Motor Scraper, recently added to the Allis-Chalmers motor scraper line, are featured in an eight-page illustrated catalog (MS-1226) now available from the company's Construction Equipment Division, Milwaukee, Wis. Photographs, illustrations and specifications help tell the new model's design and construction story.

• Charles A. Owens, prominent in the coal industry for nearly a half century and founder of the Imperial Coal Corp. in Central Penna., died in Miami, Fla., July 20, at the age of 73. Funeral services were held in Miami and in New York with burial in Woodlawn Cemetery.

Advertiser's Index

AUGUST, 1957



This fire truck delivers 100 gallons of water a minute, with a 450-foot head.

New M-S-A® Mine Fire Truck *mechanizes* fire fighting

Here's the mechanized way to fight underground fires.

Designed for mobility and fast hook-up, the new Model 2100 M-S-A Mine Fire Truck provides the volume and pressure to put fires out in a hurry. Rugged, low-slung, all-steel, this unit will negotiate a No. 2 turnout with its standard eight roller bearing wheels. Wheels have 5-inch tread for easy maneuvering.

Standard overall length of this Mine Fire Truck is 18 feet to centerline of automatic couplers, with an overall width of 7 feet. Height, up to 50 inches (2100 gallons) determines the tank capacities. Tank fills easily through a 6-inch breather hole at top.

Painted with high visibility yellow enamel, the Model 2100 has a 20 hp 3500 rpm electric motor which couples directly to a two-stage centrifugal pump. Combination fog and straight stream nozzle is standard equipment. The top of the tank contains storage capacity for 800 feet of 2-inch M-S-A Fire Hose.

Write for our bulletin for complete details on the performance of this unit.

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